CLAIMS

1. A method of optical authentication and identification of objects, characterized in that it consists in illuminating with coherent light a volume-wise at least partially scattering surface of reference objects under specified illumination conditions, in recording the speckle patterns thus obtained for various nominal values of illumination parameters and also in a range of values around these nominal values, then, upon the verification of other objects or of the same objects, in illuminating these objects under the same nominal conditions and in comparing each time the speckle pattern thus obtained with those which were recorded and in retaining the objects if their speckle pattern corresponds to one of those that was recorded.

2. The method as claimed in claim 1, characterized in that the parameters are one at least of the following parameters: wavelength of illumination of the objects, distance of focusing on the reference object, position of the illumination source, orientation of the objects.

3. The method as claimed in claim 1 or 2, characterized in that the speckle patterns are preprocessed before recording.

4. The method as claimed in claim 3, characterized in that the preprocessing consists in compressing the images.

5. The method as claimed in claim 4, characterized in that the compression consists in performing one at least of the following operations: Fourier transform, fast Fourier transform, wavelet transform, cosine transform.

6. The method as claimed in claim 5, characterized in that the image is normalized, preserving only its phase

information.

7. The method as claimed in claim 5 or 6, characterized in that the preprocessing also consists in removing from the images the values corresponding to the low spatial frequencies and to the high spatial frequencies.

8. The method as claimed in one of the preceding claims, characterized in that the comparison of the speckle patterns is done by correlation.

9. The method as claimed in claim 8, characterized in that the decision of a comparison is taken on the basis of criteria weighting at least one of the following results:
- the logarithm of the deviation between the amplitude of the correlation peak and a predefined threshold,
- the distance between the current position of the correlation peak and the nominal position,
- the variance of these data over several successive measurements.

10. The method as claimed in one of the preceding claims, characterized in that a database of reference patterns is constructed and that the authentication or identification is performed using this database.

11. The method as claimed in one of the preceding claims, characterized in that a calibration of the readers is performed with the aid of a calibration image so as to determine the critical parameters.

12. The method as claimed in one of the preceding claims, characterized in that the authentication or identification is borne out by interrogating a reader.

13. The method as claimed in one of the preceding

claim 1, wherein the recording of the speckle patterns is done by holography.

14. The method as claimed in claim 1, wherein the characteristics of the optical part of the reader are adjustable and that the positioning error, if any, of the object is corrected while tending to reduce its measurement error.

15. The method as claimed in claim 14, wherein the "zero" position of the reader having been determined, the reader is positioned according to coordinates drawn at random and the speckle image obtained is compared with the image which ought theoretically to be obtained.

16. The method as claimed in claim 1, wherein information identifying the object of another nature is recorded in addition to the speckle images.

17. The method as claimed in claim 16, wherein the identification information is contained on the surface or in the interior of the object.

18. The method as claimed in claim 17, wherein the identification information is borne by one at least of the following supports: magnetic track, electronic chip, optical storage area, bar code.

19. A device for the optical authentication and identification of objects, comprising : an optical recording device with laser source, a storage device and an optical reading device with laser source, whose illumination beam illuminates the objects and whose optical device forms on the detector of the reading device an image of the illuminated area of these objects, parameters of these optical devices being modifiable.

AMENDED SHEET

20. The device as claimed in claim 19, wherein the modifiable parameters are one at least of the following parameters: wavelength of the laser source, direction of emission of the laser beam, focusing of the laser beam, position of the laser source, inclination and position of the object with respect to the laser beam.